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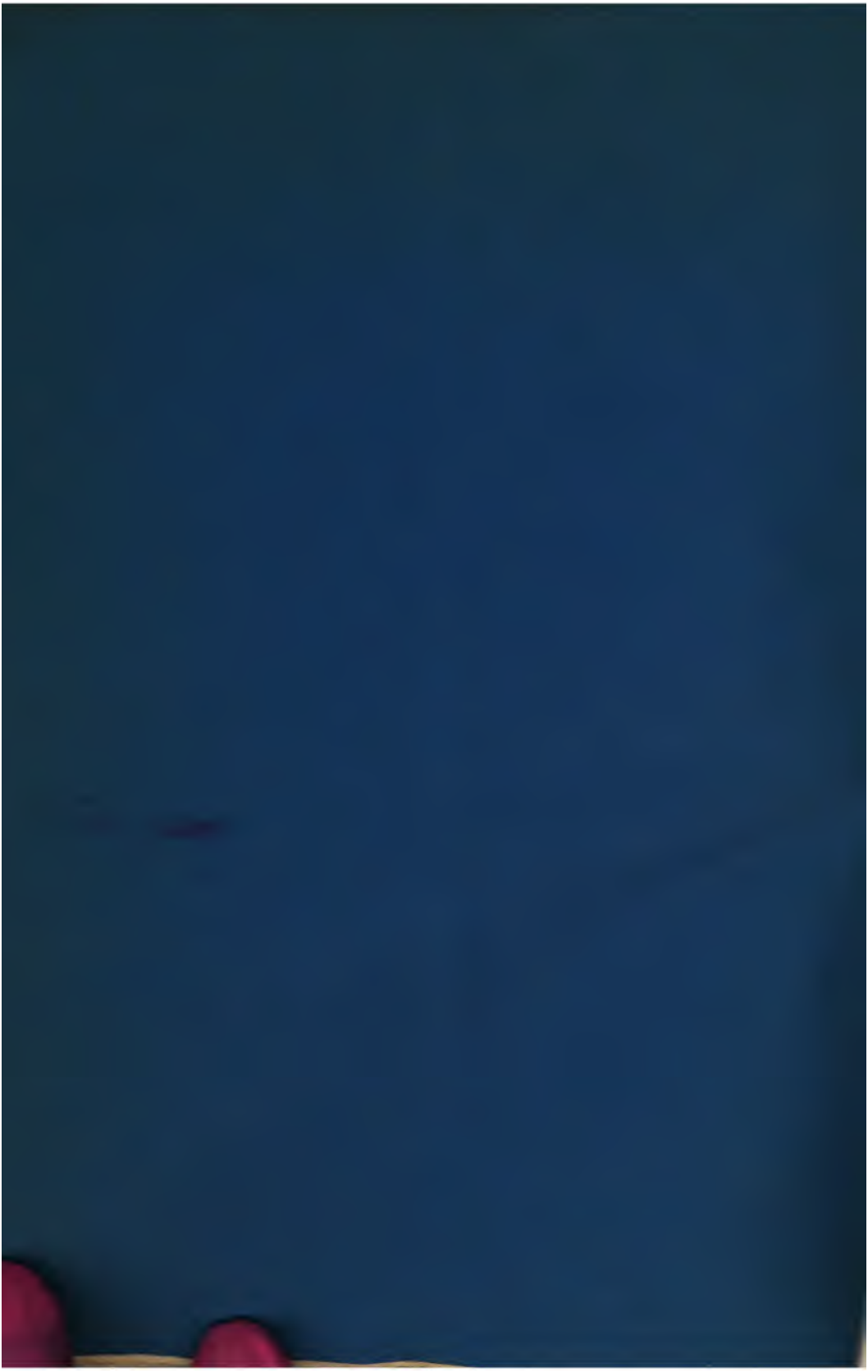

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[From Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne, Vol. VIII.]

ADDRESS TO THE MEMBERS

OF THE

TYNESIDE NATURALISTS' FIELD CLUB,

READ BY THE PRESIDENT,

R. F.
REV. CANON WHEELER, M.A.,

AT THE THIRTY-SEVENTH ANNIVERSARY MEETING,

HELD IN THE MUSEUM OF THE NATURAL HISTORY SOCIETY,

NEWCASTLE-UPON-TYNE, ON FRIDAY, MAY 11TH, 1883.

Ladies and Gentlemen,—It is again once more both my pleasure and my duty, as your President, to sum up the proceedings of the Club during the year of office which closes for me to-day. When you again elected me to fill the post I felt that you did me an honour which I little deserved.

Our First Field Meeting was held at Blanchland on Whit Monday. A very numerous party assembled at the Central Station, Newcastle; some joined us in the hope that they would have the double enjoyment which beautiful scenery ever affords, and at the same time profit by the knowledge they might gain from those who had become more deeply learned in the great book of Nature than they themselves were.

The forethought of our excellent and indefatigable honorary Secretaries had provided even for such a gathering, and carriage accommodation in ample abundance was awaiting us on our arrival at Benfieldside Station. The drive thence to Blanchland was all that could be desired. Sunny skies, pleasant companions beautiful scenery, all combined to enhance our pleasure and to crowd our memories with happy recollections. The antiquarian, the historian, and the naturalist alike found an ample field for

the gratification of their various tastes and inclinations at Blanchland.

The days when the Norman ruled in England seemed almost to live before us as we wandered around the site of an old Premonstratensian Abbey, founded by Walter de Bolbec in 1175. One could picture the abbey with its monks in their best and most prosperous days, their learning, their care for the poor, and the one bright centre of civilization and culture which the abbey then formed amidst the rough and rude dwellers around. Then little by little early zeal decaying, and errors neither light or trivial creeping in. Then the sweeping whirlwind of Reforming times, destroying the monastic life, and iconoclastic hands levelling the work of the skilled Norman builders to the ground. Then happier times again arising, and good Bishop Crewe leaving his estate to trustees, in the hope that the generation yet unborn might profit both in body and mind by the generous disposition of his property and by the teaching given in the church and schools which he so founded and endowed.

We wandered in happy groups of twos and threes o'er field, and stream, and wood, gathering as we went here a flower and there a moss, rare and beautiful to the eyes of the unlearned botanists, who, ignorant alike of the mysteries of the Natural or Linnean systems, enjoyed possibly with even keener relish than their more learned companions, the beautiful works of Him who has clothed the Lily of the field with its glorious colouring, and made everything beautiful in its season.

But neither history, archæology, botany, or any other kindred science will satisfy the needs of whole man (body as well as mind must be cared for), and here again the forethought of our excellent and painstaking Secretaries were made clearly evident by the ample repast which the keeper of the inn had provided. Mr. Thompson, after dinner was ended, gave us some interesting notes on certain eggs which he had recently found. Our homeward journey was without any special incident.

The next Meeting was at High Force, in Teesdale. A region of deepmost interest to the plant collector from the peculiar flora

which marks, or did mark, its vegetation. Alas! "the trail of the Tripper" has left its mark even on the lengthening miles through which Tees rushes from the moment when it springs into life, near to its even more famous twin sister, the Tyne, down to its exit into the sea.

The ruthless destruction of plants, too often from mere thoughtlessness, is becoming a very serious evil. Even amongst the mountains of Switzerland the destruction of rare plants has been as marked as in England, and consequently in some parts whole sections of country have been closed to ordinary visitors. But it is not only the visitor and the plant collector for botanical purposes who are the sinners in this matter. A regular trade is carried on by the Swiss in beautiful Saxifrages, Sempervivums, Ferns, and other rare plants by persons who make it their business to seek them for sale. So great has this evil become that, I am informed, very recently measures have been taken to prevent the exposure for sale of such plants in the markets of Geneva.

Our members on this occasion gathered in no great numbers. But the party was a very pleasant one. Cronkley Scar and the parts close at hand were those which formed the centre of attraction on the first day.

On the second our plans were laid further afield, and so first Cauldron Snout, then the Moor Farm at Birkdale, and up the Maize Beck to High Cup Nick, were the places to which our thoughts and our hopes tended.

A beautiful morning ushered in a bright but not over warm day, and merrily we sped onwards, after paying our reckoning and saying farewell to the obliging host of the capital inn at High Force. The walk was extremely pleasant, and close attention was paid by some of our party to the peculiarities of the strata through which the Tees and Maize Beck force their way, while others were not less pleased by forming the acquaintance of some of the more rare plants growing on the moorland side.

A most welcome lunch of simple fare was procured at Birkdale, and so we reached the Nick just as gathering clouds warned us

that a storm was not far off, and the distant thunder warned us not to linger.

"Far along,
From peak to peak, the rattling crags among,
Leaps the live thunder, not from one lone cloud,
But every mountain now hath found a tongue."

The brunt of the storm did not reach us, but broke with great fury over Weardale.

A visit to High Cup Nick had been a long-desired purpose with some of our party, and it seemed to them almost like the realization of a day dream, as they stood on the edge of the ridge of that wondrous gap, looked along the valley, and saw far off the distant panorama of Westmoreland. They felt as if the half had not been told them. It is a view in England once seen never to be forgotten. True, a mist had gathered over the distant hills and shut out much, but enough remained to write down the moments we spent there deep in memory's tablets. But we could not linger, as we gladly would have done, for the day was waning to its close, and many a mile yet lay before us ere we could reach our homes. So pressing on o'er fell and crag we reached the Farm at Harwood Flats, where conveyances were waiting to take us on to Appleby. A good and substantial tea at the King's Head gave new impulse to our energies, and after a very beautiful railway ride we separated at Barnard Castle, some to return to their daily toil, others to go back again to High Force.

I was not present at the two following Meetings, as a long previously arranged journey to the Black Forest and Switzerland rendered my absence from England necessary. But the Club will be no loser by one of those excursions. A very interesting narrative of the one to the Yorkshire Caves and Craven, drawn up by Mr. T. T. Clarke, will be found in the present volume of our Transactions, page 50.

The excursion to St. Mary's Loch, in Selkirkshire, did not draw many together. Some twelve members only were present.

On the second day the source of the Tweed was visited, and on the homeward journey some of the party lingered awhile in the interesting border city of Carlisle.

And so we bade farewell, for this season at least,

. . . . . to the pastures
So sunny and bright!
The herdsman must leave you
When summer takes flight.

We shall come to the mountains again when the voice
Of the cuckoo is heard, bidding all things rejoice,
When the earth dons her fairest and freshest array,
And the streamlets are flowing in beautiful May.

Ye pastures and meadows,
Farewell then once more!
The herdsman must go,
For the summer is o'er.

The October Meeting, as usual the last of the series, was held near home. The members met at North Shields, and under the kind and able guidance of J. F. Spence, Esq., proceeded to visit the Fish Quay, and to inspect the very important works which the Corporation of Tynemouth have carried out of late years. To any one interested in the fauna, aye and even in the flora of the sea, our visit to the Fish Quay was a source of great gratification. Most willingly were the spoils of the trawler's net and the captures of the fisherman's hook submitted for our inspection, and some were inclined to linger on beyond the last allotted moment. A few specimens were found worthy of selection for a place in the Museum of Natural History, while others were taken to less ambitious collections. After leaving the Fish Quay we proceeded along the river margin to the Salt Works. We were most courteously and kindly shewn over them by Mr. Ogilvie, the present proprietor, who explained the whole process of salt making.

This is now the last surviving portion of what was once a great industry at Shields, and the neighbouring villages of Cullercoats and Hartley.

I have no facts at hand to enable me to speak accurately of the trade in salt from Shields, but from some memoranda I possess, I find that in 1706 one Thomas Fearon, of Cullercoats, leased a portion of land at Cullercoats, for the purpose of erecting salt pans thereon, "together with free liberty at all times to load, ship, and send away any quantity of salt which the said Thomas Fearon should make in the said salt pans." That there were salt works there long before the date of the above lease there can be no doubt, nor that the manufacture on a considerable scale was carried on, for I find from the records of the Custom House at Blyth that in the Michaelmas quarter of 1723, 1962 tons of salt were exported from the then small harbour and port of Cullercoats.

Leaving the Salt Works the party proceeded along the shore towards the Tyne Pier works, and so to Cullercoats, where tea was provided at the Huddlestone Arms. After tea Mr. Clarke read the paper, already referred to, on the Caves of Yorkshire and the features of the Craven District.

So ended our Field Meetings for 1882.

I have often wished that our out-door gatherings were of more practical use, in an educational point of view, than they are; and that by some arrangement some one or more friends conversant with the special features of the Natural History of the place to be visited could always be the leader and guide, or guides, of those who wished to add to their store of knowledge. If by any means this could be done I am sure it would add at once to the usefulness and the popularity of the Club. No field which comes within the scope of the Naturalist's work but affords "fresh fields and pastures, ever new," for his research and his labour. Take, for example, Botany. I cannot claim any special or deep knowledge of this subject, and I am quite sure that many members of our Club have a far greater and more accurate acquaintance with that interesting study than I have, but possibly I may still be pardoned if I venture to present a few thoughts which have occurred to me.

When in Switzerland last year my attention was drawn to

what is, to me, a deeply interesting branch of the botanist's labour, and one, as far as I know, almost unworked. It is the influence which man has exercised on Plant life. Viewed from one point a moment's consideration will show that this is obvious enough, but in another the facts are far less striking, though possibly more instructive.

In centuries long long passed away how different an aspect did these islands present in their woodland scenery. Many of our most familiar trees were then altogether unknown to the dwellers in Britain. Very few, save those whose thoughts have been given to Arboriculture, know how much the beauty of our land has been enhanced by the introduction and naturalization of trees from far distant climes. The Spruce Fir or dark Norway Spruce, *Abies excelsa*, was not known here some three hundred years since. It was well known in Norway, in Switzerland, and is found in countries stretching from Cape Clear to Behring's Straits. The Silver Fir, *Abies pectinata*, is even a more recent introduction, though nearly contemporary with the Spruce.

In the Park at Alnwick there are some noble specimens; and in the Duke of Argyle's place at Roseneath, on the Clyde, there are, or were, Silver Firs about 170 years old and 140 feet high. No other British tree rears its head heavenward so loftily as this.

The Larch, with its exquisite green leaves put forth in early spring, but so bare and desolate in winter, is but a modern friend. Its introduction is memorable as being coupled with the rebellion of 1745. It was James Duke of Athole who first planted it to any extent.

But not to weary you with more examples of trees of whose introduction a certain record exists. For who knows not some of those which have of late years been introduced into our gardens and our shrubberies from far away lands? Some of them hereafter may perhaps become as common and as useful as the Larch, the Silver Fir, or the Spruce.

There are other trees about whose incoming we know nothing, save that there was a period when their present home knew them not. It is very hard to realise that they too owe their presence among us to man's skill and energy. The Elm, so identified in

song and story with our village gatherings, was once unknown in Britain. We know not when it first rooted itself in English soil (it is supposed the Romans introduced it), but we know from our fossil forests and in other ways when it was not amongst us.

A reverse side to this picture might also be worked out.

There are trees once very common, but are now comparatively rare. They have ceased to be cared for and esteemed because there is no longer the use for their wood which was once the case. The Yew is a well known instance of this. In the days when the battles of Crecy and Poitiers were fought and won, it was by the English archers' skill that the victory was mainly achieved. The bows were of Yew. And great must have been the consumption of wood, and vast the destruction of such a slow growing tree as the Yew, to meet the demands of the army in Edward the Third's days. Thus in 1341 we find a proclamation sent* forth ordering a large number of bows and arrows, "because we want many bows and arrows for an expedition against France, which we have taken in strong hand." There were ordered 7,300 bows, 14,550 sheaves of arrows, each containing 24 (thus giving about four dozen rounds for each bow), 2,000 separate heads for the arrows, and 50 dozen cords for the bows. They were to be paid for at 12d. each; each sheaf of arrows with sharp heads 14d., and without 12d.

This, considering the great difference of the purchasing power of money in those days and in ours, seems a high price.

The invention of gunpowder and muskets erelong rendered the bow an obsolete weapon, and with the bow the Yew fell into comparative disuse. For centuries afterwards it was the wood from which better class spoons were made, the Beech or the Sycamore furnishing that for commoner ones; but now, as a Kentish farmer not long since remarked to me, even its value for that purpose was gone. The iron and the nickel spoon have banished the yew one to the regions of flint and steel tinder boxes and other like commodities.

But there is a field of observation, which neither strikes the

* Longman's "Edward III.," Vol. I., p. 167.

mind or the eye so readily as this, less obvious, less easy to work out, but fully as interesting.

The humble plants which are found in the field, or on the mountain slope, by the edge of the dusty road, or in the marshy pool, how came they there? Are they wanderers from some far off clime? from some neighbouring country? or have they always been dwellers in this land?

Let us take an instance or two in point, which may act as finger posts to guide us in our enquiries.

Switzerland, like other lands, has been largely intersected by railways, and one of the best known of those lines is that which carries the traveller, eager for the sunny skies of Italy, from Geneva along the shores of beautiful Lake Leman to the foot of the Simplon Pass. Before that line was constructed there was a flora quite peculiar to the Rhone Valley between Sion and the Lake. I believe that I am perfectly correct in saying that nowhere else in Switzerland were some of the plants to be found. But of late years those plants, or some of them, have become not uncommon in districts far removed from their original habitat. How has this been effected? Have the seeds availed themselves, like man, of the mighty steam horse to emigrate to other, and possibly more congenial, lands? How else can the formation of the road have brought about this result? That the seeds have been conveyed by human hands is altogether out of the question. If the railroad has been the means of widening the area of the growth of these particular plants, may not the older and slower ways of locomotion have been used to the same purpose?

That certain plants do follow man's footsteps admits of no doubt. Thus the Indians of North America call the common Plantain the "White man's foot," because it invariably follows the footsteps of Europeans. This is familiar to many from the way in which Longfellow speaks of it in the Song of Hiawatha—

> "Where'er they tread, beneath them
> Springs a flower unknown among us,
> Springs the white man's foot in blossom."

Again, the New Zealander calls the Chickweed "The mark of

the pale face;" and the Yellow Sorrel of the Cape is known in Malta as "The Englishman's plant." And yet, I suppose, no one can entertain the idea for one moment that these plants have been purposely introduced by man into these lands. No loving attachment, as in the case of the Scotchman to the Thistle, exists in any mind, so far as I am aware, to any of them. Indeed, as a most thoughtful and eloquent writer well puts it,* "It is a law of Nature that plants should be diffused as widely as possible wherever the circumstances are favourable to their growth. . . . . But man interferes with this law in his processes of gardening and horticulture. His object is to cultivate beautiful or useful plants within enclosures, from which all other plants are excluded. He wishes to separate from the struggle of the elements, and from the competition of other species, certain kinds of flowers or vegetables which are good for food or pleasant to the eye. In this he is only partially successful, for into that plot of ground which he has set apart from the waste common of Nature a large number of plants intrude, and with them he has to war a constant warfare. These plants are known by the name of weeds. . . . . There is one peculiarity about weeds . . . they only appear on ground . . . which has been disturbed by man. . . . . Have these plants always been weeds? If not, where is their native country? No satisfactory answers can be given to these questions. . . Most of our weeds possess all the characteristics of a desert flora, special adaption to a dry soil and arid climate. The Dock and the Dandelion have long tap roots, the object of which is to store up a supply of water, enabling the plants possessing them to live through a long rainless period, and in spots from which moisture has vanished. . . . . The Dead Nettle is covered with a silky hair, a provision made to attract the moisture of the air, and so to counteract the drought of the circumstances in which it grows."

But this subject may be carried yet further. It not only pertains to the weeds of the gardens. But the question naturally arises where is the true, the original, the native home of

* Hugh Macmillan.

each and all the various forms of vegetation which clothe the mountains of Switzerland, which are the distinctive flora of the wild and uncultivated parts of our own country, our moors, our fens, as far as they exist still, our hills, and our mountains. The glowing Poppy, the lovely blue Cornflower, and others found amongst corn crops, which seem to speak to us, by the brightness and glory of their colour, of lands of unclouded sunshine. They have wandered, who can say how, far from their native home, and emigrating, have given a beauty to our fields which we do not realise, simply because we have never thought about it.

Another consideration ere I turn to a different subject. Every one knows that some plants are few and far between in their homes. How the ardent plant collector revels when his good fortune enables him to gather one of them, only to imprison it amidst the dingy folds of his drying book! These plants are either, may we not think so? the stragglers of an army in retreat or the scouts of an army in invasion. It is by no chance, but by some law, which needs more observation than has been given to it, that these rarities find their resting place. Again, how can we account for the leaps and bounds which some plants sometimes seem to have made. Their home easily traced many many hundreds of miles away; but a colony has been clearly established in some remote far away spot, no intermediate station being traceable. Thus at Roche, in the canton Vaud, in Switzerland, in a wild forest, a Cyclamen, whose home is Italy, sometimes known as the Cyclamen of Naples, is found in comparative abundance. Nowhere else is it to be seen wild on the north side of the Alps. What has brought it to Roche? Whence came it previously? How has it overstepped the lofty Alpine summits? Again, the beautiful *Hierochloe borealis* was found a few years since for the first time growing in the Isle of Limmat, a few miles below Zürich. No other specimen was known. A little while afterwards it was found growing near Einsiedlin, the well known great pilgrimage route, from whence the torrent Sihl rushes down through most picturesque gorges to the Lake of Zürich. The suggestion naturally presented itself to the

mind, "Oh, the seeds have evidently been conveyed by water to Limmat, on the lower part of the Lake," and it is reasonable to think so. But then the question comes, How was it introduced to Einsiedlin? The place nearest to Einsiedlin where it is known is Munich, and even around there it passes as a rare plant. To find it in abundance one must go to the far north, towards the coast of the Baltic.

But I must pause, deeply interesting as such an enquiry as the present one is, for if the pen were allowed to run on and one's thoughts to dwell on all the analogous cases, we should not reckon them by scores but by hundreds; and so we must bid adieu to the plants of the field and the flowers of the forest and turn to the mighty ocean.

"There is a pleasure in the pathless woods,
There is a rapture on the lonely shore,
There is society, where none intrudes,
By the deep sea, and music in its roar:
I love not man the less, but Nature more."

The mysteries of the depths of the ocean have, of late years, been revealed to a very great extent by the researches made by the officers of the "Challenger" and other like expeditions. The magnificent volumes, which are being issued at distant intervals, giving the results of the observations of the "Challenger" naturalists, will when completed, form an unequalled monument at once of patient labour and accurate research.

Years ago Dr. Carpenter very pertinently remarked that "the foundation of the whole of geological science, that is the interpretation of the phenomena presented to us in the study of the earth's crust, must be based upon the study of the changes at present going on upon the surface of the earth, including, of course, the depths of the sea." But true as this has been ever since geology became a science, still it is only in very recent times that it has been possible to investigate, with any approach to accuracy, any but the shallower seas.

It is to submarine telegraphy that we owe the first systematic attempts at deep-sea soundings. It was obviously necessary, for the purpose of laying the cable which first, as by a thin line,

united Europe with the continent of America, to ascertain beforehand the depths of the ocean, and also the nature of its bottom. Commander Dayman's expedition in 1857 may justly be considered as the pioneer of all subsequent explorations.

It would be altogether out of place, in a brief address like the present, to enter more fully into the history of the investigations carried on by Sir Wyville Thomson, Count Pourtales, the Swedish Spitzbergen expedition, and others. Before these observations were made it was a commonly received belief that the sea had a uniform temperature below a certain depth, of 39° F., and that the zero of animal life was reached at a depth of 300 fathoms. But the deepest soundings show a lower temperature than that. Indeed the temperature of 39° would appear to be confined to a depth not exceeding 1000 fathoms.

The average depth of the ocean, as ascertained from the "Challenger" observations, is two and a half miles, or 13,000 feet. The deepest sounding of the "Challenger" was 4,475 fathoms, but this has since been exceeded off the coast of South America by a recent American observation. These long-extended and most varied and accurate enquiries have thrown a new interest around the subject of the dwellers in ocean depths, and have very widely extended the range of our knowledge.

Mr. Murray, in the "Proceedings of the Royal Society,"* has classified the deposits met with during the "Challenger" voyage under the heads of Shore Deposits, Globigerina Ooze, Radiolarian and Diatomaceous Ooze, and Red Clays. The shore deposits are, of course, of less consequence and interest than those of the deep seas. The most interesting feature, probably, in the shore deposits is the abundance of Glauconite, or other green Silicate, which occurs as grains and as casts of the interior organisms whose tests have disappeared. The phenomenon is mainly confined to depths of less than 700 fathoms. Possibly there may be some connection between these Silicates and the Red Clays of the deeper ocean.

The Globigerina Ooze is not met with south of 50°, nor, probably, much beyond 60° N.; but within these limits it is, after

* Vol. XXIV., p. 578.

the Deep-Sea Clays, the most abundant of oceanic deposits. It consists largely of the dead shells of Globigerina, Orbulina, and Pulverulina, etc. With regard to the rest of the calcareous elements of Globigerina Ooze much of it consists of "Coccoliths" and "Rhabdoliths." No one appears to know much about the organic position of these things. The Botanist and the Zoologist seem to regard them with equal suspicion. Whatever they are they secrete a large quantity of Carbonate of Lime.

Next we have the Radiolarian and Diatomaceous Ooze. The siliceous deposits of organic origin are the result of Silica-secreting creatures, which abound on the surface waters, and also apparently in the deepest waters, of all the oceans and seas visited by the "Challenger." About half way between Japan and New Guinea there is a depth of 4,575 fathoms, the deepest "Challenger" sounding, with a bottom of Ooze, containing chiefly the remains of Radiolarians and Diatoms, and other deep sea Rhizopods. In this sounding there was a very small amount of amorphous clayey matter, and no Carbonate of Lime organisms are expressly mentioned.

As to the Red-Clay deposit, conspicuously *the* deep-sea deposit, the following analysis of a sample dried at 110°, from a sounding in 3,150 fathoms, will throw much light upon it.

Water and Organic Matter	10·40
Silica	53·30
Alumina	17·40
Ferride Oxide	11·70
Lime, Magnesia } in combination with Silica	1·35
Carbonate of Lime	3·10
Magnesia	1·90
Sulphate of Lime	0·85
	100·00

As to animal life in the deep sea, the most important question is, To what depths do living creatures descend? This is not capable of so simple an answer as might at first seem possible. Only a net which can be sent down securely closed, and then opened and towed along, and then closed again before being

hauled up, can give any definite and sure information on the matter. Such a net is both difficult to construct and to use. Mr. Alexander Agassiz has, however, made a few experiments with such an instrument, and found, when he tried it off the American coast, that the animals extended down to about 50 fathoms' depth, but not at all below 100 fathoms. The problem as to how far this result is one which applies generally, is the most important with regard to deep-sea science now awaiting solution. It is still an open question whether any of the well known Globigerinæ, of the shells of which the deep-sea Globigerina Ooze is chiefly made up, live at the bottom, or whether they are all Pelagic, and the shells only drop down to the bottom after death.

There can be no question that Globigerina Ooze and the deep-sea deposits are, in their ultimate derivation, products of the denudation of the earth's surface.

It is but a slight step indeed from the foregoing remarks to the subject of our Sea-Fisheries, which are at once such a fertile source of food to man, and such an attractive field of labour to the dwellers on our coasts. It is with no little satisfaction that I can refer to the part the Tyneside Field-Club has taken in bygone years in reference to this at once very interesting and important subject.

It is now more than twenty years since the subject of the then condition and prospect of our Sea-Fisheries was first-debated at an Evening Meeting of our Club. The information then drawn forth was all that was really known at the time, and little enough it was. Mr. Henry Fenwick, the then member for Sunderland, availing himself of the knowledge then gathered together, brought the subject before the House of Commons, and moved successfully, for the appointment of a Royal Commission. Professor Huxley, Mr. Caird, and Mr. Shaw-Lefevre were appointed Commissioners. They commenced their enquiry at Cullercoats, and afterwards proceeded to hold meetings at every fishing station in Great Britain and Ireland. A most able and exhaustive Report, together with all the evidence taken, was subsequently published. This is the foundation on which all subsequent

enquiry has been based, and from this the present deep and widespread interest in our Fisheries has arisen; culminating, as it is now doing, in the great International Fishery Exhibition to be opened to-morrow in London.

Not only has there been a most plentiful supply of literary effort bestowed on this not so long ago altogether neglected subject, but attention has been directed by eminent Naturalists to the habits of Fish, and many most valuable additions to our knowledge as to the mode of spawning and feeding have resulted from their observations. The Fishery laws have been altered, and the whole subject is now in a very different position indeed to what it was when our Club first took up the work. Surely we feel some slight gratification that the tiny seed has sprung up and borne such a useful and plentiful harvest!

Another field of investigation into the forces which are ever being exerted around us is being very earnestly worked, and rapidly developed, Meteorology. No subject attracts more general interest. For some years it was my fortune to render some small service to the Tyneside Club as Editor of the Meteorological Reports. The demands upon my time, from an ever-growing Parish and other work, compelled me, very reluctantly, to resign that office. To my deep regret, and to the loss of Science, by the breaking up of the able staff of observers, no one was found ready to take up the work, so well commenced and carried on by my predecessor, Mr. Mennell. A series of stations, practically covering the whole of the two counties of Durham and Northumberland, afforded opportunities of registering the phenomena of wind and weather, and of recording other natural phenomena, possibly without any parallel in other districts of England.

Had the Club been able to secure the services of an Editor, we should have had, in the course of a few years, such a mass of recorded facts as would have given us a knowledge of the peculiarities of our local climate not to be found elsewhere in our island. But vain are the regrets over lost opportunities! One can only hope that even yet some one may be found ready to resume the work, and with more leisure and far more ability to carry it on in future years.

It may now almost be said that Meteorology has been lifted from the depths of obscurity and contempt into the position of one of the highest branches of scientific research. Possibly no single step has been taken for many a year which is likely to lead to discoveries of greater interest and importance than the observations now being taken in the Arctic regions. Hitherto the information obtained from thence on meteorological subjects has been very incomplete. But it has also been felt that from thence there were in store discoveries which would one day prove of the greatest value and importance. Amongst the few facts already ascertained is, that the lowest temperature does not coincide with the geographical pole, but is concentrated on two points; one in Siberia, the other in North America. It is to Lieut. Weyprecht, the discoverer of Franz Josef Land, that the world is indebted for the suggestion that the North Pole should be encircled by a series of fixed observatories, and that two stations should be established also in the Antarctic Seas. I have not the time, nor is this the place, to enter into the history of this movement. It must suffice to say that by the 1st of May, 1881, Professor Wild was enabled to say that the eight stations needed had been secured.

In July, 1881, at S. Petersburg, it was determined that the observations should be commenced at all stations in the Polar regions, as well as in those of the temperate zone, as soon as possible after August 1, 1882, and that they should be continued until September, 1883. The stations were finally allotted thus: Denmark has charge of Godthaab. America has her post in Lady Franklin Bay, in Smith Sound, the most northerly of all the stations. Germany in Cumberland Sound, and England at Fort Rae, near the Great Slave Lake. America has also a station at Point Barrow. Russia occupies the mouth of the Lena, and Holland takes Dickson's Haven. A Prussian branch station has also been established at Moller Bay, in Nova Zembla. Norway is responsible for the work at Bosekop, in the Alten Fjord. Sweden selected Spitzbergen; Austria, Jan Mayen Land; and a station has also been fitted up at Sodankyla, on the Scandinavian Isthmus. The Germans have also secured the help of the Mora-

vian missionaries in Labrador, the coast there extending along the line of minimum depression. France has gone far afield, having established a post near Cape Horn; and a third German party is stationed on one of the islands of Southern Georgia, some 1,100 miles from Cape Horn. Materials for a comparison on a very extended scale will therefore be forthcoming from all parts of the world.

All meteorological and magnetic phenomena will be observed hourly during the whole time, and on term days, 1st and 15th of each month, magnetic observations will be made every five minutes, and always at the same time during the 24 hours. The magnetic observations are intended to make us thoroughly acquainted with the phenomena of magnetic perturbations and storms, and their connection with the Aurora Borealis.

That the result of all these combined efforts will be greatly to advance the knowledge of the various agencies which control the condition of the atmosphere, and possibly to extend our knowledge of electrical and magnetic forces in directions altogether unexpected, there can be no doubt. The publication of the results will be looked forward to with intense interest, not only by the world of science but by others also who can scarcely be brought within that category.

But there is a field of observation open to every one in relation to the weather too little known. It is as to the indications which the higher clouds in their varying forms give us as to atmospheric disturbances which are impending.

Very recently the Hon. and Rev. F. A. Russell read a paper before the Meteorological Society, from which I venture to quote a few passages. "Next to frequent readings of the barometer, and a knowledge of the distribution of atmospheric pressure, cloud observations, especially of cirrus, were of great use in forecasting the state of the weather. Cirrus is generally supposed to float at heights varying from 16,000 to 40,000 feet and more. But according to Mr. Glaisher's balloon observations this height may probably be sometimes more than fifteen miles. Its appearance suggests electrical influence in the determination of form; it is the only cloud which is not normally rounded in

outline, and which is sometimes composed of striæ, nearly at right angles to each other. It is also the only cloud which sometimes appears to radiate from a point near the horizon, thus showing the lines are parallel to each other, and their real length in their apparent direction."

No one amongst the dwellers on the coasts of Northumberland and Durham will have forgotten the unparalleled gale which swept so suddenly down upon us on October 14, 1881, and which caused such fearful devastation everywhere. Uprooting countless trees in Northumberland and Scotland, trees which had braved storms for scores and scores of years. The fearful destruction of our ships and sailors will have written that sad day's work even more deeply and permanently on many a heart than the loss of property has done. The storm travelled with great rapidity, and broke upon the west coast during the night. The cirrus "observed on October 13," the day before the storm, "gave earlier information than the barometer of the coming gale. It may be stated generally that cirrus of a long, straight, feathery kind, with soft edges and outlines, or with soft delicate colours at sunset and sunrise, is a sign of fine weather. Curly wisps and brown back pieces are not a bad sign, but their exact appearance should be noted. . . . . The harder and more distinct the outline, and the more some particular forms are repeated, the worse the results."

It is, however, full time that I drew this address to a conclusion.

Look where we will, either in the heavens above us, with the bright and glorious suns and stars, which form the field of the astronomer's investigation, or down to the deepmost valleys of the ocean, all, all tell the same lesson, how stupendous are the works of Him who made them all. How each fresh peep into mighty and beautiful works of Creation does but open the door to further search, and reveal treasures of knowledge before altogether unsuspected. Only let us pursue our investigation as simple searchers after Truth, not as those who seek for facts in order to support some strongly conceived and foregone conclusion, and to bolster up and strengthen some pet theory, or as Lord

Bacon long, long ago wrote:—"Truth, which only doth judge itself, teacheth, that the inquiry of Truth, which is the love making, or wooing of it, the knowledge of Truth, which is the presence of it, and the belief of Truth, which is the enjoying of it, is the sovereign good of human nature. The first creature of God, in the works of the days, was the light of the sense: the last was the light of reason: and His Sabbath work, ever since, is the illumination of His Spirit. First He breathed light upon the face of matter or chaos; then He breathed light into the face of man; and still He breatheth and inspireth light into the face of His chosen. The poet that beautified the sect, that was otherwise inferior to the rest, saith yet exceedingly well, 'It is a pleasure to stand upon the shore, and to see ships tossed upon the sea: a pleasure to stand in the window of a castle, and to see a battle, and the adventures of it below: but no pleasure is comparable to the standing upon the vantage ground of Truth, and to see the errors, and wanderings, and mists, and tempests in the vale below: so always that this prospect be with pity, and not with swelling or pride. Certainly it is Heaven upon Earth, to have a man's mind move in Charity, rest in Providence, and turn upon the poles of Truth.'"

Obituary Notices.—During the past year the Club has had to lament the loss of two of its oldest members, Mr. George Wailes and Mr. R. B. Bowman.

Mr. Wailes, who was an original member of the Club, and its President, 1860, died about 31st Oct., 1882. He had been for a long time unable to attend to business or to follow the studies that had been the delight of his life. He devoted himself chiefly to Entomology and the growing of Orchids and Alpine plants. He formed a good collection of British Butterflies and Moths, and contributed a Catalogue of the local Lepidoptera to the Transactions of the Club. He possessed a good library of Works on his favourite subjects.

Mr. R. B. Bowman, whose death took place very suddenly in the Old Museum, Nov. 24th, 1882, had been a member of the

Club from 1859, and, though taking no active part in its working, was an ardent sympathizer with all students in Natural History. He was early associated with the Messrs. Hancock, Hutton, Hewitson, Alder, Burnett, and Wailes in their Natural History pursuits, devoting himself chiefly to Botany, and occupied a distinguished position among its leading investigators, and became an authority whose opinion was always of weight. He was a genial kindly man, and ever ready to impart his knowledge to earnest students.—*J. W.*